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## **Computer Simulation and Testing Together Make the Virtual Proving Ground**

**MG John E. Longhouser**

Computer simulation is changing the way the U.S. Army prepares to fight wars, and saving the Government money at the same time. We are finding ways to do things differently, to prepare for the next war, not the last one. We are turning the power of the computer chip into combat power and the power of synthetic testing. Eventually, everything from pistols to tanks and missiles will be developed and tested in part via computer simulation. This concept, known as the virtual proving ground, is faster and more cost effective than the traditional method of build-and-test. It also means less impact on the environment and communities near test ranges, as design and preliminary testing takes place in computers, and as munitions go to the firing range only for final confirmation.

We have demonstrated this process numerous times in the Moving Target Simulator at Aberdeen Proving Ground. Using this simulator, we have reduced live firings and cut the number of personnel required for this test in half. We also save an estimated \$1.8 million every year. This is just one of many success stories and only the beginning of what we at TECOM hope to accomplish in the future.

While computer testing may in coming years reduce the number of people needed to conduct programs, testing - including field tests - will continue to be a priority. You always have to shoot at a tank to validate the virtual testing. The soldiers must work effectively with their weapons beginning in design and test. You can't eliminate the soldier from the design and test process.

We are moving away from an acquisition process where a high-cost prototype is field tested, followed by building subsequent high-cost prototypes reflecting incremental improvements and more field testing. The system we are moving toward means prototype construction will wait until computers have refined and tested the design. When a prototype is built, computers can simulate testing of its individual components, such as a fire-control system, before the entire piece is assembled and tested. Only then will soldiers drive the vehicles, track the targets, shoot the guns, and fire the missiles. So far about 10 percent of the Army's new equipment undergoes some virtual testing. By the end of the century, as funding for testing decreases, we believe about half will evolve in an artificial environment to some degree.

Keeping up with changes in the testing field is a continuing challenge. So many new ideas are being tried at so many locations by so many talented and dedicated people, that the answer to the problem stumping a tester may be being studied or even be fully formed at another test center. But its only helpful if the tester with the problem finds out about the new idea in a timely fashion. That's why we have vehicles for information dissemination like this TECOM Technology Report and TECOM's home page on the World Wide Web at [www.atc.army.mil/~tecom](http://www.atc.army.mil/~tecom). It's also why we sponsor the annual Test Technology Symposium, this year scheduled for 18-20 March 1997. I'm looking forward to sharing my perspective with the symposium audience, as well as hearing some of the latest and greatest developments from all the test centers, all the Services, and from

industry representatives. Remember we are all in the business of building successful acquisition programs.